CLAIMS

1. A method of forming a pattern in a low-k dielectric material comprising:
providing a mold having a complement of the pattern thereon; and
pressing the mold into the low-k dielectric material.

2. The method of claim 1 wherein the low-k dielectric material comprises a low-k polymer.

3. The method of claim 1 wherein the low-k dielectric material consists essentially of a low-k polymer.

4. The method of claim 1 wherein the low-k dielectric material consists of a low-k polymer.

5. The method of claim 1 further comprising forming a conductive material within the pattern.

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6. A method of forming a pattern in a low-k dielectric material, comprising:

providing a semiconductor substrate having a low-k dielectric material thereover;

providing a mold having a first pattern comprising projections and valleys between the projections;

pressing the low-k dielectric material between the mold and the semiconductor substrate to form a second pattern in the low-k dielectric material, the second pattern being substantially complementary to the first pattern; and

removing the mold from over the low-k dielectric material.

7. The method of claim 6 wherein the mold comprises a siloxane composition.

8. The method of claim 6 wherein the mold comprises a silicone composition.

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9. The method of claim 6 further comprising aligning the mold and substrate relative to one another before the pressing, and wherein:

the semiconductor substrate has an optical alignment pattern supported thereby; and

the mold comprises a region through which the optical alignment pattern can be viewed during the aligning of the mold and substrate relative to one another.

10. The method of claim 6 further comprising aligning the mold and substrate relative to one another before the pressing, and wherein:

one of the semiconductor substrate and mold has a pin associated therewith during the aligning;

the other of the semiconductor substrate and the mold has a receptacle associated therewith during the aligning; and

the aligning comprises mating the pin within the receptacle.

11. The method of claim 6 wherein the second pattern comprises openings extending through the low-k dielectric material, and further comprising forming a conductive material within the openings.

12. The method of claim 11 further comprising forming a redistribution layer within the openings of the second pattern.

13. The method of claim 6 wherein the second pattern comprises shallow trenches within the low-k dielectric material and deep openings through the low-k dielectric material, and further comprising forming a conductive material within the trenches and openings.

14. The method of claim 13 wherein the conductive material within the trenches and openings corresponds to at least a portion of a redistribution layer.

15. A method of forming a pattern in a mass provided over a patterned material on a semiconductor wafer comprising:

providing a mold having a complement of the pattern formed in the mass thereon; and

pressing the mold into the mass.

16. The method of claim 15 wherein the mass does not consist essentially of photoresist.

17. The method of claim 15 wherein the mass does not comprise photoresist.

18. The method of claim 15 wherein the pattern formed in the mass is aligned relative to a pattern in the patterned material by:

providing a first alignment article associated with the patterned material and a second alignment article associated with the mold; and

aligning the first and second alignment articles relative to one another during the pressing of the mold into the mass.

19. A method of forming a mold, comprising:

providing a template having a complement of a desired mold pattern thereover, the template being approximately the size of a semiconductor wafer and the desired mold pattern being a pattern utilized for contact lithography during semiconductor processing;

providing a sheet having holes extending therethrough;

providing a mold material precursor between the sheet and the template;

pressing the mold material precursor between the sheet and the template;

curing the mold material precursor during the pressing to convert the precursor to a mold material having the desired mold pattern; the mold material penetrating through the openings in the sheet and being joined with the sheet to define a mold comprising the mold material and the sheet; and

removing the mold from the template.

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20. The method of claim 19 wherein the pressing and curing comprise hot isostatic pressing of the mold material precursor.

21. The method of claim 19 wherein the mold material is a thermoplastic material.

22. The method of claim 19 wherein the cured mold material is a semi-solid material.

23. The method of claim 19 wherein the cured mold material is a silicone rubber.

24. The method of claim 19 wherein the sheet comprises a substantially rigid material.

25. The method of claim 19 wherein the sheet material is a metallic material.

26. The method of claim 19 wherein the sheet comprises spring steel.

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27. The method of claim 19 wherein the template has a first alignment article associated therewith, the sheet has a second alignment article associated therewith, and further comprising aligning the first and second alignment articles relative to one another before the pressing.

28. The method of claim 27 wherein one of the first and second alignment articles is a pin and the other of the first and second alignment articles is a receptacle; and wherein the aligning comprises mating the pin within the receptacle.

29. The method of claim 27 wherein the template is shaped substantially identically to a semiconductor wafer; wherein the template is provided within a holder prior to the pressing, and wherein the first alignment article is part of the holder.

30. The method of claim 27 wherein the template is a semiconductor wafer; wherein the template is provided within a holder prior to the pressing, and wherein the first alignment article is part of the holder.

31. The method of claim 27 further comprising utilizing the mold to form a pattern in a material across a semiconductor wafer.

32. The method of claim 27 further comprising utilizing the mold for contact lithography of a mass across a semiconductor wafer; the method including:

providing a semiconductor wafer having a mass thereover, the wafer having a third alignment article associated therewith;

aligning the second alignment article with the third alignment article; and

after aligning the second and third alignment articles with one another, pressing the mold relative to the mass to form a reverse image of at least a portion of the mold pattern within the mass.

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33. The method of claim 32 wherein the semiconductor wafer is provided within a holder prior to the pressing, and wherein the third alignment article is part of the holder.

34. The method of claim 32 wherein one of the second and third alignment articles is a pin and the other of the second and third alignment articles is a receptacle; and wherein the aligning comprises mating the pin within the receptacle.

35. The method of claim 32 wherein the third alignment article is a first optical pattern, and is supported by the semiconductor wafer; wherein the mold comprises a substantially transparent portion and a second optical pattern within the substantially transparent portion; and wherein the aligning comprises aligning the first and second optical patterns relative to one another.

36. A mold configured to pattern a mass over a semiconductor substrate during contact lithography of the mass, and comprising:

a substantially rigid sheet having holes extending therethrough; and

a patterned material joined to the sheet, the patterned material extending through the holes in the sheet, the patterned material having a pattern therein which is a reverse image of a pattern which is to be formed in the mass during contact lithography.

37. The mold of claim 36 wherein the patterned material is a thermoplastic material.

38. The mold of claim 36 wherein the patterned material is a semi-solid material.

39. The mold of claim 36 wherein the patterned material is a cured siloxane material.

40. The mold of claim 36 wherein the patterned material is a cured silicone rubber material.

41. The mold of claim 36 wherein the sheet is metallic.

42. The mold of claim 36 wherein the sheet is spring steel.

43. The mold of claim 36 wherein the sheet has an alignment article associated therewith and configured to align the mold with the semiconductor substrate during the contact lithography.

44. The mold of claim 36 wherein the pattern in the patterned material corresponds to a reverse image of at least a portion of a redistribution layer.

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